Is it still a real treat? Adults' treat ~~food~~ provision to children

Liran Christine Shan[a,*], Claire McCafferty[a], Mimi Tatlow-Golden[b], Claire O'Rourke[c], Robert Mooney[c], Barbara Livingstone[d], Kirsty Pourshahidi[d], Clare Corish[a], John Kearney[e], Patrick Wall[a], Celine Murrin[a]

[a]School of Public Health, Physiotherapy and Sports Science, Woodview House, University College Dublin, Belfield, Dublin 4, Republic of Ireland

[b]Faculty of Wellbeing, Education & Language Studies, The Open University, Stuart Hall Building, 2nd floor, Walton Hall, Milton Keynes MK7 6AA, UK

[c]Amarach Research, City Business Campus, Dublin 24, Republic of Ireland

[d]School of Biomedical Sciences, Ulster University, Cromore Road, Coleraine, Co. Londonderry, BT52 1SA, UK

[e]School of Biological Sciences, Dublin Institute of Technology, Kevin Street, Dublin 8, Republic of Ireland

* Corresponding author:
Liran Christine Shan
Address: Woodview House, University College Dublin, Belfield, Dublin 4, Republic of Ireland
Telephone number: +353 (0)1 716 3472
E-mail address: christine.shan@ucd.ie

Is it still a real treat? Adults' treat food provision to children

Abstract

Consumption of high-energy foods in the absence of hunger has been identified as a key target to address in the area of obesity. For children, such foods are often provided by adults as treats. There is limited understating of adults' treat giving. The present study aimed to understand adults' provision of treat ~~food~~s to children on the Island of Ireland. A total of 1039 participants, including parents, grandparents, child minders and education practitioners completed a face-to-face survey in their home. Participants defined their treats for children primarily as 'something nice', 'deserved/earned' and 'something special'. The top three motivations for treat foods provision were 'to reward for good behaviour' (42.3%), 'because the child(ren) ask' (42.2%) and 'to make the child(ren) feel better' (29.4%). Almost all participants would provide treat foods at celebrations and 52.5% always did so. In addition, 68% participants had structured weekly and/or daily treat for children. Treats provided to children were dominated by energy-dense foods. The top three were sweets, chocolates and ice-creams, being used by 45.2%, 45.1% and 38.8% participants. Variations were observed across different adult groups, in terms of their treat giving behaviour. The main observation was that adults' treat foods provision has become habitual. The findings can help develop targeted strategies to encourage the reduction or replacement of food treats for children.

Keywords: snacking, obesity, children, child feeding, parenting

INTRODUCTION

Childhood obesity is one of the most serious public health challenges of this century, and needs to be addressed on multiple levels, including the role of the environment and children's access to unhealthy foods (World Health Organization, 2012). Consumption of energy-dense, nutritionally poor foods in response to external stimuli and in the absence of hunger has been identified as a key target to cope with this challenge (Bellisle, 2014). For children, such foods are often provided by adults as treats (Bugge & Lavik, 2012). The general public are often advised to keep treat food intake to a minimum (Safefood, 2016). Yet, health professionals' understanding of the term 'treat' may be quite subjective; therefore it is important to investigate adults' own definition and treat giving behaviour.

'Treat', 'sometimes foods' and 'junk' are the three most common terms parents used to describe 'not-everyday' foods (Petrunoff, Wilkenfeld, King, & Flood, 2014). Parents' descriptors of 'treats for children' are dominated by foods not recommended by healthy eating guidelines, such as chips, ice-cream, chocolates, cakes, doughnuts, biscuits, takeaway and soft drinks (Curtis, James, & Ellis, 2010; Petrunoff et al., 2014), although some parents also identified expensive healthy foods in limited supply (e.g. strawberries), as treats (Pescud & Pettigrew, 2014).

Despite recognising that treat foods are less healthy and should be consumed infrequently, many parents provide them daily (Pescud & Pettigrew, 2014), triggered by multiple motivations and social contexts, including behavioural rewards and control, expressing love, social network effects, peer-pressure, classroom celebrations, birthday parties, cultural events, such as Christmas, Halloween, and Easter and other out-of-the ordinary occasions (Curtis et al., 2010; Davison et al., 2015; Fisher et al., 2015; Herman, Malhotra, Wright, Fisher, & Whitaker, 2012; Larson et al., 2017; Moore, Goodwin, Brocklehurst, Armitage, & Glenny, 2017; Pescud &

Pettigrew, 2014; Porter & Grills, 2013; Sabey, Rauer, Haselschwerdt, & Volling, 2017). Treat foods can also be routinized, for instance, dessert, after-school, Fridays, and weekends (Bugge & Lavik, 2012; Pescud & Pettigrew, 2014).

Health professionals haves encouraged the reduction of treat foods for children, and the use of non-food alternatives, for instance, extra play/story time, a trip to the play-ground, disco-dancing at home, etc. (Sharry, 2014). Instead of food, teachers could recognize children's efforts by giving them special opportunities (e.g. selecting a song/game/story book for the play group, having first choice of equipment for gross motor play) (Eliassen, 2011). There is very limited research about how non-food treats could be used and received by children in practice. A qualitative study exploring expressions of parental love showed that, parents sometimes use toys and gifts (e.g. a new book, some new playdoh) as alternatives to treat foods (Sabey et al., 2017). An experimental study suggested that children were just as likely to choose a cheap toy as sweets at Halloween (Schwartz et al., 2003).

While the literature sheds some light on the practice of adults' treat giving to children, studies related to this topic are dominated by qualitative research work; there is a lack of quantitative understanding about the extent to which treats are given to children in different contexts. Moreover, most of the studies focused on parents only. Other adults, such as grandparents, childminders, nursery practitioners, school teachers and sport coaches have received scarce attention about their treat provision behaviour. Childminders are those who mind children in childminders/children's home; they are self-employed, agree their own terms, fees and conditions with parents (O'Hagan, 2012).

It is important to include grandparents because they still remain a popular form of childcare in many countries including China, Australia, the US, the UK, Ireland and a few Mediterranean

countries (Aassve, Meroni, & Pronzato, 2012; Chambers, Rowa-Dewar, Radley, & Dobbie, 2017; Chen, Liu, & Mair, 2011; Share & Kerrins, 2009). They normally feel entitled to indulge children with food treats (Knight, O'Connell, & Brannen, 2014). It is also crucial to consider childcare and education practitioners, given that treats are commonly employed for the management systems of schools and early childhood settings, for the purposes of rewarding, fundraising and classroom celebration (Causton, Tracy-Bronson, & MacLeod, 2015; Eliassen, 2011).

The current study aims to provide quantitative data of adults' treat giving understanding and behaviour on the Island of Ireland (IOI), with the focus on: 1) their definition of 'treats'; 2) the contexts or situations in which treat foods are provided to children and 3) the types of treats (including both food and non-food options) being used. This study will also compare the treat ~~food~~ provision among parents, grandparents and education practitioners (e.g. nursery practitioners, school teachers, sport coaches), so that targeted strategies can be developed to encourage different groups to employ alternative strategies to their habitual treat food behaviour.

METHODS

Sampling and participants

A cross-sectional survey was conducted with adults (aged 18 and above), who had lived on IOI for the past 3 years and who had child rearing responsibilities. Grandparents were eligible to participate if they saw one or all of their grandchildren at least fortnightly. Quota sampling was employed. The quotas included: area (Republic of Ireland 75%, Northern Ireland 25%), which was in line with the population distribution between these two areas (Central Statistics office of Ireland, 2016; UK Office for National Statistics, 2017);~~,~~ roles (parents 60%, grandparents 20%, Crèche/pre-schooler carers, childminders, teachers and sports coaches 20%), gender (female

60%, male 40%) and social class (ABC1 40%, C2DE 60%). Parents and females were ~~more~~over ~~recruited~~sampled, because they usually have a higher level of involvement in child rearing than other adults. Participants from a lower social class (i.e. C2DE) were purposively slightly oversampled, compared to around 50% in the whole population (Central Statistics Office of Ireland, 2017a). The rationale was over-consumption of extra foods is more common among children from a lower social class (Campbell et al., 2002). Participants were recruited from 104 sampling districts across the IOI. A power calculation (Noordzij et al., 2010) was conducted. It suggests that to estimate the proportion of the population that has a certain treat giving behaviour, a minimum sample size of 134 is required to achieve 95% power with a significant level (alpha) of 0.05. A sample size of 1000 (around 10 participants per sampling point) was considered to be sufficient to estimate the behavioural patterns of the whole population and sub-groups (i.e. parents, grandparents, and other adults).

The survey was ~~administrated~~ administered by professional fieldworkers through face-to-face interviews in participants' homes. Computer assisted personal interviewing (CAPI) technology was employed: the questions were displayed on a touch-screen tablet computer (one question per screen); the field worker read them to the respondent, and entered the respondent's answers directly into the computer. CAPI has unique advantages of ensuring responses to mandatory fields, automatically bypassing questions not relevant to the respondent, randomising the order of options when needed, and validating the sampling points using GPS coordinates (Caviglia-Harris et al., 2012). Each interviewer was given one or multiple sampling districts. They selected a street within that district and attempted to interview at every third house until the quotas were filled and they had completed the ten interviews. The fieldwork was conducted between October 2017 and January 2018. The study was conducted according to Declaration of Helsinki

guidelines and received approval from the first author's university research ethics committee. Written informed consent was obtained from all participants.

Research instrument

The questionnaire had three main sections: context/motivations for treat food provision, type of treats used, and definition of treats. Cognitive interviews with eight volunteers were conducted to assess the clarity of the questionnaire. The CAPI system was tested with a small sample (n=30) of the target population.

For parent and grandparent participants, if they had more than one child or grandchild between 2 and 17, they were asked to focus on the child whose birthday came next, and this child's name was referred to in all questions. The purpose was to avoid confounding factors, in light of the practice used by Vereecken, Keukelier, and Maes (2004) and Gevers, Kremers, de Vries, and van Assema (2015)'s study design.

Contexts and motivations of treat foods provision

A list of contexts or motivations (see the second column of Table 3) for treat provision to children was generated from a prior focus group study (McCafferty et al., 2018) and literature (Bugge & Lavik, 2012; Davison et al., 2015; Moore et al., 2017; Pescud & Pettigrew, 2014; Petrunoff et al., 2014; Sabey et al., 2017). For each context, participants were first asked about whether they provided treat foods in the specified context. If the participant indicated doing so, they were asked about provision frequencies, using an eight-category scale adapted from the Food Frequency Questionnaire (MacIntyre, 2009): 1 = rarely or never; 2 = a few times a year; 3 = once a month; 4 = 2-3 times per month; 5 = once a week; 6 = 2-4 times per week; 7 = daily; 8 = more than once a day. The frequency was not asked after the 'daily treat' and 'weekly treat'

questions. For the question regarding celebration occasions, the pilot test showed that participants found it hard to suggest a frequency on the eight-category scale, accordingly, a four-point frequency scale was used: 1 = rarely or never; 2 = sometimes; 3 = often; 4 = always. In the end, participants were asked about their overall frequency of treat giving ("*in general, how often you would give [ ] treat foods*"), the previous same eight-category scale was used.

Type of treats

From the focus group study, a list of all iterations of identified treats was developed. Foods and beverages were put into categories based on food groups defined in the Irish National Nutrition Pre-school Survey (Irish Universities Nutrition Alliance, 2011). In total, 23 food and non-food items (see the first column of Table 5) were presented to participants in a randomized order. From the list, 'chips' means finger shaped cuts of potatoes that have been deep fried and served hot; 'crisps' refers to thin slices of potatoes that have been deep fried until crunchy; and 'takeaways' refers to cooked foods to be eaten off the premises. Participants were first asked to select all items they used as treats for the child(ren). They were allowed to add any other treat they used. Afterwards, participants were asked to indicate the most frequently used treat (single answer only).

Definition of treats

Based on the focus group findings and literature (Pescud & Pettigrew, 2014; Petrunoff et al., 2014), 15 phrases were selected to test participants' perception of the essence of treats (see the first column of Table 2). Participants were asked to select up to three phrases they felt defined a treat for the child or children.

Socio-demographics and background information

Standard socio-demographic questions were included in the survey regarding both the participants and the children in their care.

Data analysis

All statistical analyses were conducted using statistical software package IBM SPSS Statistics 20 (SPSS Inc., Chicago, IL, USA). Participants were originally classified into three groups, namely, parents, grandparents and education practitioners. Sensitivity tests showed that within the group of education practitioners, childminders were different from the rest of the group in terms of the pattern of answers. Accordingly, a four-group division was used for final analysis: parents (i.e. parents/guardians), grandparents, childminders (i.e. childminders/baby sitters/nannies) and education practitioners (i.e crèche/pre-schooler carers, primary school teachers, secondary school teachers, and sports and leisure coach/leaders). Pearson χ^2 tests were employed to examine differences across these groups. Monte Carlo estimate of the exact P value for the Pearson χ^2 test was used when over 20% cells of the frequency table have expected counts less than 5.

RESULTS

Description of the participants

In total, 1039 participants completed the survey (Table 1). ~~Three quarters of participants were from the Republic of Ireland (ROI), and one quarter from Northern Ireland (NI), reflecting the population distribution between these two areas on IOI (Central Statistics Office of Ireland, 2016; UK Office for National Statistics, 2017).~~ The study sample had good representation of both males and females, and different types of adults who are responsible for children. The urban/rural divide and the ethnicity distribution of the participants were close to the population-level statistics (Central Statistics Office of Ireland, 2017b; Northern Ireland Department of

Agriculture Environment and Rural Affairs, 2017; Northern Ireland Statistics and Research Agency, 2014).

Table 1 Characteristics of the participants (*n* 1039)

Characteristic	*n*	%
Area of Ireland		
Republic of Ireland (ROI)	789	75.9
Northern Ireland (NI)	250	24.1
Sex		
Female	634	61.0
Male	404	38.9
Other	1	0.1
Age (years)		
18-24	25	2.4
25-34	215	20.7
35-44	374	36.0
45-54	201	19.3
55-64	109	10.5
65 and above	115	11.1
Role		
Parent/guardian	651	62.7
Grandparent	210	20.2
Child minder, baby sitter, nanny	61	5.9
Crèche/pre-schooler carer	25	2.4
Primary school teacher	27	2.6
Secondary school teacher	15	1.4
Sports, leisure coach and leader	50	4.8
Living area		
Urban/sub-urban	703	67.7
Rural	336	32.3
Education completed		

Primary or lower	61	5.9
Secondary*	491	47.2
Apprenticeship/trade certificate	107	10.3
Primary degree/nursing qualification	201	19.3
Postgraduate/higher degree	170	16.4
Other	9	0.9
Ethnicity		
White Irish	806	77.6
White British	126	12.1
Any other white background	72	6.9
Black, Asian and other including mixed background	33	3.2
Don't know/refused	2	0.2
Age range of child(ren) being reported		
Pre-school age (year 2-4)	231	22.2
Primary school age (year 5-12)	580	55.8
Secondary school age (year 13-18)	228	21.9

*For ROI participants, secondary-level education includes 'leaving certificate or equivalent' and 'leaving certificate applied'; for NI participants, 'GCSE or equivalent', 'GCE A level or equivalent', and 'leaving certificate applied'.

Definition of Treats

To define a treat for the child(ren) in their care, participants were invited to select up to three terms from a list. Almost all selected three terms (81.7%), most frequently 'something nice' (45.2%), 'deserved/earned' (35.1%), 'something special' (32.7%) or 'fun' (27.6%) (Table 2). Treats were less frequently defined by cost ('affordable', 'expensive'), size ('big', 'small') or nutrition ('sweet', 'healthy', 'unhealthy/bad for you'), although 22% considered a treat must be 'sweet', and 16.6% selected 'healthy'. Terms indicating spoiling, bribery, and low frequency ('usually forbidden', 'rare') were chosen by less than 13% of participants.

Adult groups' definitions of treats varied. Education practitioners favoured 'deserve/earned' (42.7%), were less likely to define treats as 'something nice' (23.1%), and more likely to consider them 'rare' (21.4%). Interestingly 'to spoil' was among the top four terms used by childminders (27.9%), but was less frequently selected by other participants, including grandparents (18.6%).

Table 2 Terms participants selected to define a treat for children (*n* 1039)

Definition of treats	Total (*n* 1039)		Parent (*n* 651)		Grandparent (*n* 210)		Child minder (*n* 61)		Education practitioner (*n* 117)		Group differences†
	%*	Top 5	%*	Top 5	%*	Top 5	%*	Top 5	%*	Top 5	
Something nice	45.2	1	48.2	1	46.7	1	50.8	1	23.1	5	*P<0.001*
Deserved/earned	35.1	2	36.7	2	29.5	3	23.0	5	42.7	1	*P<0.05*
Something special	32.7	3	32.0	3	35.7	2	36.1	2	29.9	2	
Fun	27.6	4	27.6	4	26.2	5	29.5	3	29.1	3	
Affordable	23.1	5	24.3		27.1	4	16.4		12.8		*P<0.05*
Sweet	22.7		24.6	5	22.4		21.3		13.7		
Small	20.9		20.1		22.4		18.0		23.9	4	
Healthy	16.6		14.9		20.5		11.5		21.4		
Usually forbidden	12.7		13.7		7.1		19.7		13.7		*P<0.05*
To spoil	12.5		10.3		18.6		27.9	4	6.0		*P<0.001*
Rare	8.3		6.5		6.2		9.8		21.4		*P<0.001*
Bribery	5.8		6.8		5.2		1.6		3.4		
Unhealthy/bad for you	4.1		5.4		1.0		1.6		4.3		*P<0.05*
Expensive	3.0		3.5		3.8		0.0		0.0		
Big	1.4		2.0		1.0		0.0		0.0		

* The proportion of the participants (within the specified participant group) who selected a given term to define a treat for the child(ren) they were caring for. Participants were allowed to select up to three terms. The 'Top 5' ranks were based on the percentages.

†Levels of significance from Pearson χ^2 tests of differences between four groups (i.e. parents, grandparents, child minders and education practitioners) in terms of the proportion of participants who selected a given term.

Contexts/motivations of treat foods provision

Participants primarily offered treat foods to reward good behaviours (42.3%) and because children asked (42.2%), followed by emotion control (29.4%) and encouragement of the intake of dinner/healthy foods (26.2%) (Table 3). Treat foods were least used for occupying the children (14.4%), and gaining affections (12.8%). Nearly all participants (92.0%) would give treat foods to children at celebrations, and 52.5% always did so. More than two thirds of participants had structured weekly (64.7%) and/or daily treat foods (22.6%) for children.

Adult group's treat giving behaviour varied. Education practitioners did far less treat giving than other groups. Parents were more likely to provide structured weekly treats (75.7%); and childminders were more likely to provide treat foods to reward the child (67.2%) and to make the child feel better (41.0%). In addition, childminders (37.7%) and grandparents (33.8%) were more likely than parents (22.3%) to use treat foods to show love and care. Overall, a majority of parents (78.5%), grandparents (58.1%) and child minders (60.7%) would give children treat foods at least once a week (Table 4).

Table 3 Contexts and frequencies of the treat foods provision among participants (*n* 1039)

		Total (*n* 1039)		Parents (*n* 651)		Grandparents (*n* 210)		Childminders (*n* 61)		Education practitioners (*n* 117)		
Abbreviation	Item*	Yes	At least weekly	Yes	At least weekly	Yes	At least weekly	Yes	At least weekly	Yes	At least weekly	Group differences†
Reward	Use treat foods to reward [ ] for good behaviour	42.3%	30.6%	43.6%	33.8%	42.9%	25.2%	67.2%	52.5%	21.4%	11.1%	*P<0.001*
Child ask	Give [ ] treat foods because they ask	42.2%	28.4%	47.2%	34.1%	45.7%	25.2%	45.9%	27.9%	6.0%	2.6%	*P<0.001*
Emotion control	Use treat foods to make [ ] feel better	29.4%	14.3%	30.4%	15.2%	33.3%	16.2%	41.0%	21.3%	10.3%	2.6%	*P<0.001*
For eating dinner/fruit/vegetable	Give [ ] treat foods for eating their dinner or for eating fruits and vegetables	26.2%	19.8%	28.6%	23.3%	26.2%	17.1%	31.1%	21.3%	10.3%	4.3%	*P<0.001*
Show affection	Use treat foods to show your love or care for [ ]	23.5%	13.2%	22.3%	12.7%	33.8%	18.1%	37.7%	21.3%	4.3%	2.6%	*P<0.001*
Child nagging	Give [ ] treat foods because they kept requesting/nagging you for it	21.8%	15.2%	24.1%	17.5%	22.9%	14.3%	31.1%	19.7%	1.7%	1.7%	*P<0.001*
Peer pressure	Give [ ] treat foods because they say/you know other children are given it	19.3%	10.1%	21.2%	11.1%	19.0%	9.5%	31.1%	18.0%	3.4%	1.7%	*P<0.001*
Occupy child	Use treat foods to occupy [ ]	14.4%	8.9%	15.1%	9.1%	16.2%	10.0%	24.6%	16.4%	2.6%	1.7%	*P<0.001*
Gain affection	Use treat foods so that [ ] will love/like you	12.8%	8.9%	11.8%	8.4%	17.6%	11.4%	27.9%	18.0%	1.7%	1.7%	*P<0.001*
		Yes	Always	Yes	Always	Yes	Always	Yes	Always	Yes	Always	

Celebrations	Provide [ ] treat foods at celebrations (e.g. birthday, Christmas, Halloween, Easter)	92.0%	52.5%	96.2%	60.2%	90.0%	49.5%	93.4%	27.9%	71.8%	27.4%	*P<0.001*
Structured treat provision‡		68.3%		79.4%		64.8%		54.1%		20.5%		*P<0.001*
Weekly treat	Normally give treat foods to [ ] each week (e.g. Friday treat or weekend treat)	64.7%		75.7%		59.0%		54.1%		18.8%		*P<0.001*
Daily treat	Normally give treat foods to [ ] everyday (e.g. when the child comes home from school, after meal)	22.6%		26.7%		20.5%		18.0%		6.0%		*P<0.001*

*For parents and grandparents, the child's name was inserted in "[ ]". If they had multiple children or grandchildren, only one child was selected. For childminders and educational practitioners, "*children/pupils you are caring for*" was inserted in "[ ]".

†Levels of significance from Pearson χ^2 tests of differences between four groups (i.e. parents, grandparents, child minders and education practitioners) in terms of the proportion of participants answered 'yes' on a given treat giving behaviour.

‡"Structured treat provision" was computed from "weekly treat" and "daily treat", i.e. a participant who answered yes to either the weekly treat question or the daily treat question, was considered as having structured food treats for children.

Table 4 The overall frequencies of participants' treat foods provision to children (*n* 1039)

Treat food provision in general	Total (*n* 1039)	Parents (*n* 651)	Grandparents (*n* 210)	Childminders (*n* 61)	Education practitioners (*n* 117)	Group differences*
Rarely/never	8.8%	3.8%	9.0%	3.3%	38.5%	*P<0.001*
Less than once a month	7.1%	2.5%	8.6%	9.8%	29.1%	*P<0.001*
1-3 times a month	17.7%	15.2%	24.2%	26.3%	14.5%	*P<0.01*
1-4 times a week	57.2%	66.2%	53.8%	54.1%	14.6%	*P<0.01*
At least once a day	9.4%	12.3%	4.3%	6.5%	3.5%	*P<0.001*

*Levels of significance from Pearson χ^2 tests of differences between four groups.

Type of treats being used

Almost all the participants (98.3%) selected at least one item from the list as their treat for the children. On average, each participant selected 5 items (mean 5.19, SD 3.65). Twenty seven participants also specified other items they used as treats, such as cereal or cereal bars, yoghurt, nuts, pancakes, football socks, clothes, extra playtime and makeup.

In general, participants' most used treats were unhealthy foods (57.8%), followed by non-food treats (24.4%) and healthy foods (14.8%) (Table 5). Sweets (45.2%), chocolates (45.1%) and ice-cream (38.8%) were the most popular treats, followed by time on screen, crisps, takeaways and biscuits. In comparison, some healthy foods including berries, dried fruit, breadsticks and cheese were least popular treats.

Significant differences were observed across the adult groups. For instance, money was particularly favoured by grandparents (36.2%). In contrast to other groups, education practitioners had less treats for children. Fruit (27.4%) and stickers/stationary (27.4%) were among their top treats; however, unhealthy choices such as sweets (37.6%), chocolates (23.9%) and time on screens (23.1%) were equally favoured by them.

Table 5 Items participants used as treats for children (*n* 1039)

Item	Total (*n* 1039)			Parents (*n* 651)			Grandparents (*n* 210)			Childminders (*n* 61)			Education practitioners (*n* 117)			Group differences‡
	Used as treat*		Most used†	Used as treat*		Most used†	Used as treat*		Most used†	Used as treat*		Most used†	Used as treat*		Most used†	
	%	Top 10	%	%	Top 10	%	%	Top 10	%	%	Top 10	%	%	Top 10	%	
Sweets	45.2	1	13.7	48.4	2	13.4	37.1	3	10.5	54.1	1	14.8	37.6	1	20.5	*P*<0.01
Chocolates	45.1	2	13.0	49.5	1	13.8	42.4	1	12.9	49.2	2	14.8	23.9	4	7.7	*P*<0.001
Ice-cream, ice-lollies	38.8	3	7.0	44.4	3	7.8	38.6	2	7.6	32.8	3	3.3	11.1	10	3.4	*P*<0.001
Time on iPad/screens/TV/DVD/play station, etc.	31.2	4	8.5	35.8	5	9.5	23.3		2.9	24.6	4	13.1	23.1	5	10.3	*P*<0.001
Crisps	31.1	5	5.0	36.1	4	6.6	25.2	8	3.3	23.0	7	0.0	17.9	7	1.7	*P*<0.001
Takeaways, pizza, burgers, fast foods	29.3	6	6.9	34.9	6	7.1	24.3	10	8.6	21.3	10	6.6	11.1		3.4	*P*<0.001
Biscuits	29.0	7	7.5	31.6	7	7.1	32.4	5	11.0	24.6	5	9.8	10.3		2.6	*P*<0.001
Fruit (e.g. apples, bananas, oranges)	27.2	8	7.4	28.0	10	6.9	26.2	7	8.1	23.0	6	11.5	27.4	2	6.8	
Toys and gifts	26.5	9	3.3	28.9	8	3.5	31.9	6	4.3	13.1		0.0	10.3		1.7	*P*<0.001
Trips out (e.g. beach, park, match, soft play)	25.9	10	3.6	27.8		4.0	24.8	9	3.8	21.3	9	1.6	19.7	6	1.7	
Popcorn	21.7		1.9	28.1	9	2.8	12.4		1.0	9.8		0.0	8.5		0.0	*P*<0.001
Cakes, pastries, buns, apple tart	20.6		1.6	22.7		1.4	20.5		1.9	8.2		0.0	15.4	9	3.4	*P*<0.05
Money	20.5		5.8	20.0		4.0	36.2	4	15.2	6.6		1.6	2.6		0.9	*P*<0.001
Soft/fizzy drinks	18.2		2.3	19.5		2.5	17.1		1.0	23.0	8	6.6	10.3		1.7	
Fruit juices	17.7		2.2	17.8		2.5	17.6		0.5	18.0		3.3	17.1	8	3.4	

Stickers, stationary	16.4	2.4	15.4	0.9	13.8	1.4	14.8	1.6	27.4	3	12.8	*P*<0.01
Chips	15.0	0.8	18.0	1.1	12.9	0.0	9.8	0.0	5.1		0.9	*P*<0.01
Berries	11.9	0.8	13.7	0.9	11.0	0.5	11.5	1.6	4.3		0.0	*P*<0.05
Fidget spinners, dabbing, collectable cards, Jojo Bows, etc.	10.3	0.4	12.9	0.5	7.6	0.5	1.6	0.0	5.1		0.0	*P*<0.01
Dried fruit	9.9	1.0	10.1	1.4	8.6	0.0	16.4	1.6	7.7		0.0	
Crackers, bread sticks	9.1	1.2	10.0	0.8	11.0	2.9	4.9	1.6	3.4		0.0	
Cheese	6.0	0.4	7.1	0.3	5.7	0.5	4.9	1.6	0.9		0.0	
Homework pass	3.9	0.5	3.4	0.0	1.9	0.0	3.3	0.0	11.1		4.3	*P*<0.001
Most used treat§												
Unhealthy foods		57.8		60.7		56.7		55.7			45.3	*P*<0.05
Healthy foods		14.8		15.5		13.3		21.3			10.3	
Non-food treats		24.4		22.4		28.1		18.0			31.6	

*The proportion of the participants (within the specified participant group) who selected a given item as a treat for the child(ren) they were caring for. The 'Top 10' ranks were based on the percentages.

†The proportion of the participants (within the specified participant group) who selected a given item as the most used treat for the child(ren) they were caring for. Participants were instructed to select only one item as the 'most used treat'.

‡Levels of significance from Pearson χ^2 tests of differences between four groups (i.e. parents, grandparents, child minders and education practitioners) in terms of the proportion of participants who selected a given item as a treat for children.

§To offer top line results regarding participants' most used treats. The items were divided into three categories: unhealthy foods (sweets, chocolates, ice-cream/ice-lollies, crisps, takeaways etc., biscuits, popcorn, cakes etc., soft/fizzy drinks, and chips); healthy foods (fruit, popcorn, fruit juices, berries, dried fruit, crackers/bread sticks, and cheese); and non-food treats (time on digital devices, toys/gifts, trips out, money, stickers/stationary, fidget spinners etc., and homework pass). The division between unhealthy foods and healthy foods was based on food pyramid (The Irish Department of Health, 2016).

DISCUSSION

Significance of the results and implications

The current research is the first quantitative study investigating treat ~~food~~ definitions and practices of adults who care for, educate or coach children. This study can assist the development of target strategies to reduce the use of unhealthy foods.

Participants in our study primarily defined a treat as 'something nice', 'deserved/earned' and 'something special' – this is in contrast with two Australian studies (Pescud & Pettigrew, 2014; Petrunoff et al., 2014) showing that parents defined a treat as something infrequent, unhealthy, rare or expensive. Low-frequency or rarity was not essential to our participants' definition of a treat, possibly because of cultural differences and the wide accessibility to unhealthy foods in the modern age.

'Reward for good behaviour' was the participants' primary motivation for treat food provision, in accordance with previous knowledge that the use of foods for behavioural control is a common practice among parents and teachers (Blaine et al., 2015; Kubik, Lytle, Hannan, Story, & Perry, 2002; Raaijmakers, Gevers, Teuscher, Kremers, & van Assema, 2014). Research has shown that using unhealthy foods as a reward or an emotion control instrument may reinforce children's preference of those foods, and may increase the risk of dietary disorders, such as binge eating, emotional eating and dietary restraint (Benton, 2004; Farrow, Haycraft, & Blissett, 2015; Puhl & Schwartz, 2003). It was interesting to see 'child asking' ranked equally high as 'reward' as a trigger for treat foods provision, highlighting the importance of empowering adults to navigate such requests.

According to our study, treat foods had become a norm at celebrations: 90% of adults would provide treat foods at celebrations, and 52% always did so. One may argue that Christmas, Halloweens and the birthday only happen once a year. However, children might also receive treat foods at classroom celebrations, classmates' birthday parties, family events, graduations, fund raising, etc. The totality of these celebrations in a given year could be quite substantial for many children (Caparosa et al., 2014; Isoldi, Dalton, Rodriguez, & Nestle, 2012; Porter & Grills, 2013; Schwartz, Chen, & Brownell, 2003), therefore their overall significance on dietary behaviour should be recognised.

The current study also revealed adults' choice of treats for children: they were dominated by unhealthy foods, with sweets and chocolates as the most popular options. ~~Unhealthy foods have a cost advantage and usually satisfy children; however, they can be reduced or replaced in some contexts. For instance, an experimental study showed that children were just as likely to choose a cheap toy as sweets at Halloween (Schwartz et al., 2003).~~ Unhealthy foods are usually widely available and cheap, and generate hedonic experience (van den Bos & de Ridder, 2006). Packaged unhealthy foods, takeaways, and time on screens have the advantage of convenience. These factors partly explain their popularity as choices of treats, especially for those parents who ~~were facing~~are challenged with low income and/or time scarcity in their daily practice (Pescud & Pettigrew, 2014). Certain non-food alternatives, such as trips out, gifts and toys could possibly involve a higher time or financial cost, and a risk of ~~being failed~~ failing to meet children's expectations if the provision of unhealthy food treats has become habitual; thus they were less popular than food treats according to our data. The promotion of non-food treats should be carefully planned and tested. To our knowledge, the only study experimenting non-food alternatives to sweets was carried out fifteen-years ago, and it focused on a particular social

event − Halloween (Schwartz et al., 2003). More research should be conducted to examine the feasibility, facilitators and barriers of all those non-food treats suggested by health professionals (Sharry, 2014; Eliassen, 2011).

By including a diverse range of adults, the present study compared the patterns of treat giving among different groups. Parents, grandparents and childminders were comparable on all measurements. Between these three groups, parents had a higher use of structured weekly and daily treats, and overall provided treats more frequently. Part of the reasons behind this phenomenon is parents usually see their children more frequently than other adults, such as grandparents and sports coaches. ~~This group should be a key target group for intervention.~~ Parents often complain that grandparents are over-indulgent, and give too many sweets and high energy-foods to children (Curtis et al., 2010; Knight et al., 2014). However, according to our study, grandparents were not more likely than parents to provide food treats in many contexts, neither did they have a higher tendency to choose unhealthy items as treats. The frequency these grandparents met their grandchildren, and the quantity of their treat giving should be taken into account to make a reliable judgment on grandparents' use of food treats (as opposed to parents). The third group, child minders, ~~namely those who provide private childcare service and not employed by a company or centre,~~ are barely reported in the literature. Our study revealed that this group demonstrated a substantial use of treat foods as a reward, and they were also more likely than parents and grandparents to use treat foods in some other contexts. On the IOI, informal childminding arrangements with childminders is a grey area: there is little regulation; most childminders are not registered with the Health Service Executive, and haven't gained any formal training including nutrition education (O'Hagan, 2012). A very recent survey showed that 30% of families in Ireland opted for childminders (Congress, 2016), thus this group should be

included in children's health intervention initiatives. The current study indicated that education practitioners provided much fewer treats than other groups. Healthier choices such as fruits, sticker and stationary were among their most used treats. This is expected because many schools and childcare centres on IOI (especially at primary level), have a formal healthy-eating policy and curriculum in place. However, there is still room to improve as 71.8% of education practitioners provided treat foods at celebrations, and sweets were their first treat choice. Calorie intake during classroom celebrations and rewards could contribute 20-35% of students' daily estimated energy needs according to some observational studies (Caparosa et al., 2014; Isoldi et al., 2012).

It is worth mentioning that the study was carried out shortly after the Irish Department of Health published a revised Food Pyramid: the 'top shelf' (i.e. foods and drinks high in fat, sugar and salt) was separated from lower shelves (The Irish Department of Health, 2016). In line with this change, the 'Health Promoting School' program has encouraged schools to remove Treat Day Friday from their policies (Walsh, 2017). With this background in mind, the current study provided baseline data to set targets and to monitor progress for improvement.

Strengths, limitations and future research

The current study included a diverse range of adults who had responsibilities in child rearing, providing a comprehensive picture of their perceived essence of treats, and their treat food behaviour. The questionnaire was well established ~~upon~~ from the literature and a prior focus group study, and it was carefully tested. The sample had good geographical spread and resembled the characteristics of the research population. One limitation of this study is, in participant recruitment, for teachers, sports coaches, pre-school carers and child minders, there was no screening criteria regarding their frequencies of caring for children. There is a chance that

some ad-hoc teachers or coaches might have been included in the sample, and 'diluted' the treat giving practice we observed from this adult group. Another limitation ~~of this study~~ is this survey~~it~~ ~~is~~ was based on self-reported responses to a face-to-face interview and it is possible that biases may have been introduced through memory errors and the natural tendency of under-reporting certain behaviours that are socially undesirable. A previous qualitative study shows that many parents give children treat foods on a daily basis (Pescud & Pettigrew, 2014). In our study, participants reported much lower frequencies. It is likely some participants under-reported their behaviour. The findings should be triangulated with diaries and observation studies to provide a more accurate estimation of adults' treat giving. Future research should also be conducted to examine if the provision of treat foods varies across different social-demographical segments. Another interesting area to explore is children's own perspectives on treats, for instance, do they define treats the same way as parents? What type of treats (other than unhealthy foods) they would like to receive?

Conclusions

In the current food environment, it would be naive to think that the use of food as a treat can be avoided altogether. However, there is merit in considering how their use could be recalibrated. Greater awareness needs to be created on the fact that adults in various contexts 'treat' children with unhealthy food and that it is no longer a 'treat' when this behaviour has become normalised into their daily or weekly routine. Strategies should be developed to support adults to reduce their current use of unhealthy foods as treats, taking into account the subtle differences between different types of adults.

ACKNOLWEDGEMENT

This work was supported by *safe*food, the Food Safety Promotion Board, under Fund No. 02-2016. The funder did not play a role in the study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication.

REFERENCES

Aassve, A., Meroni, E., & Pronzato, C. (2012). Grandparenting and childbearing in the extended family. *European Journal of Population-Revue Europeenne De Demographie, 28*(4), 499-518.

Bellisle, F. (2014). Meals and snacking, diet quality and energy balance. *Physiology & Behavior, 134*, 38-43.

Benton, D. (2004). Role of parents in the determination of the food preferences of children and the development of obesity. *International Journal of Obesity and Related Metabolic Disorders, 28*(7), 858-869.

Blaine, R. E., Fisher, J. O., Taveras, E. M., Geller, A. C., Rimm, E. B., Land, T., . . . Davison, K. K. (2015). Reasons low-income parents offer snacks to children: how feeding rationale influences snack frequency and adherence to dietary recommendations. *Nutrients, 7*(7), 5982-5999.

Bugge, A. B., & Lavik, R. (2012). Forbidden fruit taste the sweetest - a study of Norwegians' consumption pattern of chocolate, sweets, salty snacks, soft drinks and the like. *Food and Nutrition Sciences, 3*, 1619-1630.

Campbell, K., Crawford, D., Jackson, M., Cashel, K., Worsley, A., Gibbons, K., & Birch, L. L. (2002). Family food environments of 5-6-year-old-children: Does socioeconomic status make a difference? *Asia Pacific Journal of Clinical Nutrition, 11*, S553-S561.

Caparosa, S. L., Shordon, M., Santos, A. T., Pomichowski, M. E., Dzewaltowski, D. A., & Coleman, K. J. (2014). Fundraising, celebrations and classroom rewards are substantial sources of unhealthy foods and beverages on public school campuses. *Public Health Nutrition, 17*(6), 1205-1213.

Causton, J., Tracy-Bronson, C. P., & MacLeod, K. (2015). Beyond treats and timeouts: humanistic behavioral supports in inclusive classrooms. *International Journal of Whole Schooling, 11*(1), 68-84.

Caviglia-Harris, J., Hall, S., Mulllan, K., Macintyre, C., Bauch, S. C., Harris, D., . . . Cha, H. (2012). Improving household surveys through computer-assisted data collection: use of touch-screen laptops in challenging environments. *Field Methods, 24*(1), 74-94.

Central Statistics Office of Ireland. (2016). Census of population 2016 - preliminary results. http://www.cso.ie/en/releasesandpublications/ep/p-cpr/censusofpopulation2016-preliminaryresults/ Accessed 12 March 2018.

Central Statistics Office of Ireland. (2017a). Socio-economic group and social class, from https://www.cso.ie/en/media/csoie/newsevents/documents/census2016summaryresultspart2/Chapter_6_Socio-economic_group_and_social_class.pdf. Accessed 5 June 2018.

Central Statistics Office of Ireland. (2017b). Census 2016 summary results - part 1, from http://www.cso.ie/en/media/csoie/newsevents/documents/census2016summaryresultspart1/Census2016SummaryPart1.pdf. Accessed 19 March 2018.

Chambers, S. A., Rowa-Dewar, N., Radley, A., & Dobbie, F. (2017). A systematic review of grandparents' influence on grandchildren's cancer risk factors. *PLoS One, 12*(11), e0185420.

Chen, F. N. A., Liu, G. Y., & Mair, C. A. (2011). Intergenerational Ties in Context: Grandparents Caring for Grandchildren in China. *Social Forces, 90*(2), 571-594.

Congress. (2016). Who cares? Report on childcare cost and practices in Ireland. Retrieved from https://www.ictu.ie/download/pdf/report_on_childcare_costs_practices_congress_2016.pdf. Accessed 1 April 2018.

Curtis, P., James, A., & Ellis, K. (2010). Children's snacking, children's food: food moralities and family life. *Childrens Geographies, 8*(3), 291-302.

Davison, K. K., Blake, C. E., Blaine, R. E., Younginer, N. A., Orloski, A., Hamtil, H. A., . . . Fisher, J. O. (2015). Parenting around child snacking: development of a theoretically-guided, empirically informed conceptual model. *International Journal of Behavioral Nutrition and Physical Activity, 12*, 109-120.

Eliassen, E. K. (2011). The impact of teachers and families on young children's eating behaviours. *Young Children, 66*(2), 84-89.

Farrow, C. V., Haycraft, E., & Blissett, J. M. (2015). Teaching our children when to eat: how parental feeding practices inform the development of emotional eating-a longitudinal experimental design. *American Journal of Clinical Nutrition, 101*(5), 908-913.

Fisher, J. O., Wright, G., Herman, A. N., Malhotra, K., Serrano, E. L., Foster, G. D., & Whitaker, R. C. (2015). "Snacks are not food". Low-income, urban mothers' perceptions of feeding snacks to their preschool-aged children. *Appetite, 84*, 61-67.

Gevers, D. W. M., Kremers, S. P. J., de Vries, N. K., & van Assema, P. (2015). Patterns of Food Parenting Practices and Children's Intake of Energy-Dense Snack Foods. *Nutrients, 7*(6), 4093-4106.

Herman, A. N., Malhotra, K., Wright, G., Fisher, J. O., & Whitaker, R. C. (2012). A qualitative study of the aspirations and challenges of low-income mothers in feeding their preschool-aged children. *International Journal of Behavioral Nutrition and Physical Activity, 9*, 132-144.

Irish Universities Nutrition Alliance. (2011). National pre-school nutrition survey - Summary report on food and nutrient intakes, physical measurements and barriers to healthy eating. http://www.iuna.net/wp-content/uploads/2012/06/Summary_Report_National_PreSchool_Nutrition_Survey_June_2012.pdf. Accessed 21 January 2018.

Isoldi, K. K., Dalton, S., Rodriguez, D. P., & Nestle, M. (2012). Classroom "Cupcake" Celebrations: Observations of Foods Offered and Consumed. *J Nutr Educ Behav, 44*(1), 71-75.

Knight, A., O'Connell, R., & Brannen, J. (2014). The temporality of food practices: intergenerational relations, childhood memories and mothers' food practices in working families with young children. *Families Relationships and Societies, 3*(2), 303-318.

Kubik, M. Y., Lytle, L. A., Hannan, P. J., Story, M., & Perry, C. L. (2002). Food-related beliefs, eating behavior, and classroom food practices of middle school teachers. *Journal of School Health, 72*(8), 339-345.

Larson, N., Miller, J. M., Eisenberg, M. E., Watts, A. W., Story, M., & Neumark-Sztainer, D. (2017). Multicontextual correlates of energy-dense, nutrient-poor snack food consumption by adolescents. *Appetite, 112*, 23-34.

Maclntyre, U. E. (2009). Measuring food intake. In M. J. Gibney, S. A. Lanham-New, A. Cassidy & H. H. Vorster (Eds.), *Introduction to human nutrition (2nd Ed)*: Wiley Blackwell.

McCafferty, C., Shan, C., Murrin, C. (2018). A socio-ecological approach to understanding why adults give food treats to children. Abstract presented at: *International Society of Behavioral Nutrition and Physical Activity (ISBNPA) 2018 Meeting*, June 3-6, Hong Kong, China.

Moore, D. A., Goodwin, T. L., Brocklehurst, P. R., Armitage, C. J., & Glenny, A. M. (2017). When Are Caregivers More Likely to Offer Sugary Drinks and Snacks to Infants? A Qualitative Thematic Synthesis. *Qualitative Health Research, 27*(1), 74-88.

Noordzij, M., Tripepi, G., Dekker, F. W., Zoccali, C., Tanck, M. W., & Jager, K. J. (2010). Sample size calculations: basic principles and common pitfalls. *Nephrol Dial Transplant, 25*(5), 1388-1393.

Northern Ireland Department of Agriculture Environment and Rural Affairs. (2017). Rural/urban statistics infographic. https://www.daera-ni.gov.uk/publications/rural-urban-statistics-infographic. Accessed 09 March 2018.

Northern Ireland Statistics and Research Agency. (2014). Northern Ireland census 2011 key statistics summary report. https://www.nisra.gov.uk/sites/nisra.gov.uk/files/publications/2011-census-results-key-statistics-summary-report.pdf. Accessed 09 March 2018.

O'Hagan, C. (2012). Who cares? The economics of childcare in Ireland. *Journal of Motherhood Initiative, 3*(1), 203-216.

Pescud, M., & Pettigrew, S. (2014). Treats: low socioeconomic status Australian parents' provision of extra foods for their overweight or obese children. *Health Promotion Journal of Australia, 25*(2), 104-109.

Petrunoff, N. A., Wilkenfeld, R. L., King, L. A., & Flood, V. M. (2014). 'Treats', 'sometimes foods', 'junk': a qualitative study exploring 'extra foods' with parents of young children. *Public Health Nutrition, 17*(5), 979-986.

Porter, G. P., & Grills, N. J. (2013). The dark side to Halloween: marketing unhealthy products to our children. *The Medical Journal of Australia 199*(8), 528-529.

Puhl, R. M., & Schwartz, M. B. (2003). If you are good you can have a cookie: How memories of childhood food rules link to adult eating behaviors. *Eat Behav, 4*(3), 283-293.

Raaijmakers, L. G. M., Gevers, D. W. M., Teuscher, D., Kremers, S. P. J., & van Assema, P. (2014). Emotional and instrumental feeding practices of Dutch mothers regarding foods eaten between main meals. *BMC Public Health, 14*, 171-178.

Sabey, A. K., Rauer, A. J., Haselschwerdt, M. L., & Volling, B. (2017). Beyond 'lots of hugs and kisses': expressions of parental love from parents and their young children in two-parent, financially stable families. *Family Process*. [In press] doi: 10.1111/famp.12327

Safefood. (2016). Managing food that should be treats. http://www.safefood.eu/Start/6-Healthy-Habits/Treat-Foods.aspx. Accessed 11 April 2018.

Schwartz, M. B., Chen, E. Y., & Brownell, K. D. (2003). Trick, treat, or toy: Children are just as likely to choose toys as candy on Halloween. *Journal of Nutrition Education and Behavior, 35*(4), 207-209.

Share, M., & Kerrins, L. (2009). The role of grandparents in childcare in Ireland: towards a research agenda. *Irish Journal of Applied Social Studies, 9*(1), 33-47.

Sharry, J. (2014). Safefood blog post: avoiding unhealthy food treats, from http://www.safefood.eu/Blog/Blog/October-2014/Avoiding-unhealthy-food-treats-(1-of-2).aspx. Accessed 5 July 2018.

The Irish Department of Health. (2016). Minister Corcoran Kennedy launches Health Food for Life - new healthy eating guidelines and food pyramid. http://health.gov.ie/blog/press-release/minister-corcoran-kennedy-launches-healthy-food-for-life-new-healthy-eating-guidelines-and-food-pyramid/ Accessed 12 April 2018.

UK Office for National Statistics. (2017). Population estimates for UK, England and Wales, Scotland and Northern Ireland: mid-2016. https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/annualmidyearpopulationestimates/mid2016#toc Accessed 19 January 2018.

Van den Bos, R., & de Ridder, D. (2006). Evolved to satisfy our immediate needs: Self-control and the rewarding properties of food. *Appetite, 47*(1), 24-29.

Vereecken, C. A., Keukelier, E., & Maes, L. (2004). Influence of mother's educational level on food parenting practices and food habits of young children. *Appetite, 43*(1), 93-103.

Walsh, A. (2017). Whole school food policy development within Health Promoting Schools - what can our schools do to promote treats. http://www.safefood.eu/SafeFood/media/SafeFoodLibrary/Documents/Professional/Events/Anne-Walsh.pdf. Accessed 13 March 2018.

World Health Organization. (2012). Population-based approaches to childhood obesity prevention. http://www.who.int/dietphysicalactivity/childhood/approaches/en/ Accessed 12 April 2018.